THE

YOUNG MECHANIC.

NOVEMBER, 1833.

CHEMISTRY.

DEUTOXIDE OF HYDROGEN.

Oxygenized Water.—This interesting compound was discovered by M. Thenard, in the year 1818.

It contains twice the quantity of oxygen that common water contains.

1. Proportion of hydrogen,	1,
2. Proportion of oxygen,	16,
Its representation number is	17.

Its specific gravity is 1·453. It is a clear, colorless liquid without odor, and possessing a metallic taste which is difficult to describe, but approaches that of tartar emetic. It remains liquid at all temperatures to which it has hitherto been exposed. Light produces no effect upon it, and but little change takes place when it is exposed to the direct rays of the sun, if it be not thereby heated to the degree at which decomposition takes place. Applied to the skin, in a diluted state, it attacks it, producing a prickly sensation, and rendering it white; when concentrated, the skin is rapidly destroyed by it.

It is decomposed at a temperature of 59° Fah. being converted into water and oxygen. At a temperature of 212° Fah. so rapidly is the oxygen extricated, that an explosion is produced. It is decomposed also by animal substances. Dropped on the dry protoxides of many of the metals, or of some of the metals in a minutely divided state, it produces violent detonations. All the

metals, except iron, tin, antimony and tellurium, have a tendency to decompose it; those which have a strong affinity for oxygen combine with it, while others retain their metallic state. In the 17th vol. of the American Journal, p. 34. Dr. Faust has suggested that this curious phenomena may be accounted for upon galvanic principles: thus, 'When any metal is placed in the deutoxide of hydrogen, a galvanic effect is produced. The hydrogen having less affinity for the *excess* of oxygen, than the metal has, the liquid becomes negative, thus acting the part of the copper plate of a battery, while the metal becomes positive, supplying the place of a zinc plate. The liquid is thus resolved into water and oxygen. If the metal be very oxidable it retains the oxygen, which is evolved, if gold, platina, &c. be used.'

Acids have the property of rendering this compound more permanent; thus, if it be heated until decomposition commence, or a little finely divided gold be put into it, the brisk effervescence which ensues from the decomposition, will be seen immediately to cease upon adding a drop of sulphuric acid. The only acids which do not possess this property, are those which possess but little acidity, or are decomposed by deutoxide of hydrogen.

The method adopted for its analysis is to boil it, with an equal quantity of water, in a retort connected with a graduated receiver filled with mercury. It is thus resolved into water and oxygen, and the oxygen is collected in the receiver.

Deutoxide of hydrogen has been applied by M. Thenard, to some old and valuable paintings, for the purpose of removing some black stains which they had contracted, with perfect success. It is well known that the whites formed of carbonate of lead, when not perfectly protected by varnish, are apt to turn black; this is occasioned by sulphuret of lead being formed, and oxygenized water has the property of converting the sulphuret into a white sulphate. M. Thenard states that the other colors were not in the slightest degree affected in his experiment, which would not have been the case had he used other agents which were suggested.

To prepare deutoxide of hydrogen, many precautions are necessary in order to ensure perfect success. We shall, therefore, minutely describe the process which has been given by M. Thenard.

1. A general outline of the process is as follows: Deutoxide of barium, is added to water containing hydrochloric acid; when dissolved, sulphuric acid is then added, which precipitates the baryta in the form of insoluble sulphate,—the water now contains hydrochloric acid and a portion of oxygen—more deutoxide of barium is added—again precipitated by sulphuric acid, and this is repeated until the liquid contains from 25 to 30 times its volume of oxygen gas. The hydrochloric acid is now removed, by the addition of sulphate of silver, and we have sulphuric acid remaining in its place, which is removed by solid baryta. We have now

deutoxide of hydrogen diluted with water. To render it pure, the water is evaporated under the exhausted receiver of an air-pump till it acquires the specific gravity of 1·452.

We shall now give the process as described by M. Thenard, and first the method of preparing the deutoxide of barium.*

1. Nitrate of baryta should first be obtained perfectly pure, and above all, free from iron and manganese. The most certain means of procuring it, is to dissolve the nitrate in water, to add to the solution a small excess of baryta water, to filter and crystallize.

2. Decompose the nitrate by heat, in a perfectly white porcelain retort. It will contain only silex and alumina in any considerable quantity, if the retort be as described ; the iron and manganese will be only in very minute quantity.

3. Divide the baryta into lumps as large as the end of the thumb, and place them in a luted tube of glass, then heat the tube to redness and pass through it a current of dry oxygen gas. The gas will be completely absorbed, however rapid the current, and consequently when it passes out, at the other end of the tube, we may conclude the operation, the deutoxide of barium being finished. When nearly cold, it should be transferred into well stopped bottles.†

1. To prepare now the deutoxide of hydrogen, place in a glass vessel surrounded with ice, a certain quantity of water (4 or 5 pints for example) and add to it as much hydrochlorate acid as will dissolve 232 grains of baryta. Then 185 grains of the deutoxide of barium, are to be slightly moistened and rubbed in a glass mortar ; when reduced to a fine paste it is to be placed in successive portions in the fluid, and will soon dissolve. Pure and concentrated sulphuric acid is then to be added, the fluid being stirred at the same time, until the sulphate of baryta is deposited in flocouli, which indicates that there is a slight excess. It is important to add enough sulphuric acid to precipitate all the baryta, but not too much ; when the proportions are properly adjusted, filtration is effected with great facility. When the filtration is completed, a small quantity of water is to be passed through the filter and added to the fluid. After this, that none may be lost, it may be washed with more water, and the water reserved for washing future filters.

This operation being finished, more deutoxide of barium is to be dissolved in the fluid; the baryta precipitated by sulphuric acid and so on, proceeding as before.

* We have made some variaitons from the words of the author, in order to condense or render more plain his meaning, but none which affect the sense, or neglected anything necessary to the success of the process.

† If the heated tube be withdrawn from the fire at a proper time, the barium will be obtained in the state of deutoxide, without the use of oxygen gas.—TORREY.

These operations are to be repeated until we have used about 3 ounces of deutoxide of barium; when the fluid will contain from 25 to 30 times its volume of oxygen.

2. When the fluid is oxygenated up to the required point, the next step is to remove the silica, alumina, oxides of iron, and manganese. For this purpose the fluid is to be saturated with deutoxide of barium, while still remaining in ice. Abundant flocculi of silica and alumina, soon separate, which are generally colored by the oxides of iron, and manganese. The whole should then be thrown quickly on a cloth, and closely compressed.

As the fluid may still retain a small quantity of the substances mentioned, it is again to be surrounded by ice, and *baryta* water added to it, drop by drop, the whole being stirred. If, when the baryta is in such excess as to be slightly sensible, there is no precipitate, it proves that all the oxides of iron and manganese have been separated.

3. If not completely separated by the preceding operation, they will be by this.

Immediately on the separation of them, the fluid must be placed on two or three filters, in order to hasten its separation from the oxides, which otherwise would soon decompose it.

The fluid which now contains only hydrochloric acid, water and oxygen, while surrounded by ice as before, is to have dropped into it sulphate of silver, until all the hydrochlorate acid is separated. When this is the case, the fluid becomes clear; until then it remains turbid. That there may be no excess either of hydrochloric acid, or sulphate of silver, small portions of the fluid may be successively tested by nitrate of silver and hydrochlorate acid. The liquid is to be filtered when this point is attained.

4. We have now a fluid composed of water, oxygen, and sulphuric acid, and it remains to separate this latter substance. For this purpose the fluid is transferred to a glass mortar, surrounded by ice, and slacked baryta, finely powdered, added by small portions at a time, and rubbed with it. When the fluid scarcely reddens litmus paper, it is to be filtered, and the filter compressed in a cloth; the saturation is then to be finished by baryta water.

5. The fluid may now be considered as pure oxygenated water, diluted with common water. In order to concentrate it, it is to be placed in a glass vessel over a dish of concentrated sulphuric acid, and the whole placed under the receiver of an air pump and a vacuum formed. By this means, the water is to be evaporated until the fluid acquires the specific gravity of 1·453.

From the Louisville Herald.

MECHANICS.

It is unfortunately the fact, that too many parents look upon mechanical employment as degrading, and prefer that their sons should be quacks and pettifoggers, rather than useful and respectable mechanics; hence it is, that our country is overrun with men calling themselves lawyers and doctors, who are at the very tail of their respective professions, but who, if their talents, or the bent of their genius had been consulted, would have made excellent mechanics, and have risen to wealth, and an influential and respectable place in society. But an absurd prejudice, or dislike to the name of mechanic, has doomed them to a life of comparative poverty and insignificance. Such men do not reflect, that if they possess talent, combined with industry and a disposition to seek information, they may rise to eminence, notwithstanding they may wear the apron of a mechanic, instead of the gown of the lawyer. Who were Franklin, Rittenhouse, Roger Sherman, and a host of others? They were mechanics—practical mechanics; but they became philosophers and statesmen, and established a fame which shall endure as long as time shall last. On this subject we copy the following sensible remarks from the Beaver Republican:

Mechanics.—'There is a strange dislike to the name of mechanic in this country, as well as elsewhere; it would almost seem a disgrace to be an industrious or useful man. Each parent thinks his child superior in intellectual capacity, and capable of filling any station, whatever his ability to qualify him therefor. Hence we everywhere meet with professional men, who would doubtless make most excellent mechanics, but, unfit for a profession, they remain all their lives in obscurity and poverty. Why is this? Have not the world yet learned to judge men by their actions, and not by the business they pursue? Look through the pages of history—whose names are brightest?—who have been the benefactors of mankind?—Why do we so often find men of sound judgment in all things else, yielding to the dictates of pride and prejudice, and preferring that their children should be brought up in idleness, rather than give them such an occupation as would enable them to become useful to themselves and others?'

PATENTS FOR MASSACHUSETTS.

Granted in March, 1833.

From the Journal of the Franklin Institute.

For apparatus for *Manufacturing Ship Thimbles;* Barnabus Thatcher, Yarmouth, Barnstable county, Massachusetts, March 2.

The first part of the apparatus is a pair of tongs, made like smiths' tongs, so formed that when shut, the jaws will form a perfect circle, equal in diameter to the outer diameter of the thimble. A concave swedge, of the proper size and form, is fitted to the hole in an anvil. The ring, heated, and held in the tongs, is then to be struck by a concave tool, properly formed, by which means the thimble will be completed. It is said that a screw, or other press, with suitable dies, may be substituted for the tools above described.

There is no particular claim made, the process being considered as altogether new in its application. We do not know that this is not the case, although it is not improbable that a mode of operating so common in the making of thousands of articles, such as the swedge, or bed, and punch, has been adopted, if not here, in some of the European navy yards, in the manufacture of ship thimbles. If this has not been the case, it is well for the patentee, as we are informed that the thimbles made by his process are not only more rapidly but much more perfectly formed than by that usually followed.

For *Machinery for Making and Pegging Shoes;* Samuel Preston, Danvers, Essex county, Massachusetts, March 8.

This is an ingeniously contrived, and, we think, a well arranged apparatus for making shoes, fastened by wooden or metallic pegs. The specification is of considerable length, and although it describes the machine clearly, it would require an engraved plate for its illustration. The claims made are the following :

'What I claim as my own invention in the within described apparatus, is that arrangement thereof by means of the intermitters, or a single intermitter, or other analogous contrivance, with the guides, and other appendages, by means of which the shoe carriage is caused to advance with the shoe thereon, whilst the pistons carrying the awls and drivers, receive, by means of guides, or formers, a lateral motion, following the shape of the sole of the shoe : whether these motions be effected precisely in the way described, or in any other, producing a similar effect.

'I claim also the arrangement of the parts of the machinery by which the pegs, or nails are driven by one set of pistons, in the holes made by the awls in the pistons by their previous descent.

'I claim, likewise, the splitting the peg from the end of a slip of pegwood, or the cutting of pegs or nails, from a strip of metal, and the instantaneous driving thereof into the proper place.

'I further claim the application of the forcing apparatus, the piston, and also the forcing wheel, and the method, subsequently described, of smoothing and polishing by means of revolving wheels.'

For a *Safety chain to be used in careening Ships;* James Fales and Thomas D. Brown. New Bedford, Bristol county Massachusetts, March 9.

The safety chain is intended to brace the mast, by connecting one end of it to the top of the mast, and the other end to chains connected with the wales. The chain leading from the top of the mast, is to be connected to those attached to the wales by the intermedium of a screw, which turns in nuts attached to the chains, and by which they may be rendered tort. These chains are to be fixed on the side opposite to that on which the vessel is to be hauled down.

The claim is to the connecting such chains in the manner, and for the purposes described.

For an improvement in the *Broad Power Loom;* John Leland, Millbury, Worcester county, Massachusetts, March 9.

After describing the construction of the loom, it is observed that in all the power looms now in use, the shuttle is driven by means of stud collars inserted into the cams by which the harness is operated, and that the usual number of beats, or jerks, for a loom weaving cloths, of from ten to twelve quarters wide, is forty per minute; and as the cams in a loom for plain cloth revolve but half the number of times the lathe beats, and but a quarter of the number for kersey, the motion given to the stud rollers is very slow, which requires the inclined planes of the picker shoe, where the stud rollers are received, to be very steep or abrupt, in order to give sufficient force to the shuttle, and the motion thus given to the shuttle is a very hard and unnatural one, producing a trembling and agitation throughout the whole loom. To obviate this difficulty, and construct a loom in which the shuttle motion shall remain the same, not only for plain cloth but for kersey, or any kind of double work, is the object of this improvement, which consists, first, in placing the lathe shaft in such a position in the loom as to admit of its operating not only the vibrating cams, but of its driving the shuttle. Secondly, in ranging the vibrating cams to the pivots on which the lathe standards rest, and hanging them to the same. Thirdly, in motioning the shuttle with but one stud roller, and one picker treadle.

For *Cementing Cloth;* Reuben Brackett, Boston, Massachusetts, March 14.

The cementing is to be effected by means of a solution of India rubber, so as to unite two edges without sewing, and in this the whole claim consists; such solutions, therefore, are to be used as are already known.

The cementing of cloth, by means of a solution of caoutchouc is not a novel process ; water proof cloth having been prepared in England and France by cementing together two thicknesses, for the purpose of making cloaks and other articles. Cloths of two colors have sometimes been so united, when it was desired to have the lining of one, and the outside of another color. As regards the uniting of seams in this way, it may undoubtedly be effected so as to render them perfectly firm, and we are not aware that the doing so has ever been proposed previously to the obtaining of the present patent. Whether the appearance of the seams will be such as to please the eye, and whether the cementing can be effected without keeping the cloth under pressure for a period which may be inconvenient, are questions which the patentee has probably asked and answered.

For an improvement in the *Roller Gin for Ginning Cotton;* William Whittemore, senr., and William Whittemore, jr., West Cambridge, Middlesex county, Massachusetts, March 21.

A very minute description of the roller gin is given in the specification, which refers throughout to perspective and sectional drawings. The parts which are claimed as new are plainly designated, and consist of 'the guard, felts, and clearer.' The *guard* is a piece of cast steel, which works upon two arms in the frame of the ginning rollers, its lower edge, which is to be about one-sixteenth of an inch thick, smooth, and rounded, drops nearly into contact with the felt or the lower roller. The object of this is effectually to prevent the seeds of cotton from being drawn in with the staple between the rollers. The *felts* are endless aprons of leather, which are substituted for cloth, as possessing many properties which render it superior to the latter article. Of these *felts* there are three, with their appropriate rollers ; one of these is the feeding apron ; the other two receive the cotton and carry it along from the ginning rollers, round which they pass. The upper apron inclines upward, and the lower apron downward ; a part of the cotton adheres to the upper felt, but the larger portion of it to the lower one. The *clearer* is a frame worked up and down by a double crank shaft, having two combs attached to it, like those of the common carding machine, and serving, in a similar way, to remove the ginned cotton from the felts.

For a *Cooking Apparatus ;* Thomas K. Anderson, Boston, Massachusetts, March 22.

The form of the part of this apparatus in which the fire is contained is that of the common cylindrical stove, with its grate and ash pit. This cylinder is surrounded by a second, extending from the bottom of the former to about two-thirds of its height. This is made tight, to contain water in which to boil meat or vegetables. The top of the interior cylinder is surmounted by an

oven, which is surrounded by a casing, for the conveyance of heated air and smoke, which must have an outlet at top. In this oven, baking, frying stewing, &c. are to be performed.

'The inventor claims as his invention the combination of apparatus above described, and its arrangement for the purposes set forth.'

We do not perceive upon the face of this arrangement anything which recommends it to special favor. The cylindrical vessel in which meat and vegetables are to be boiled, is attached firmly to the stove, and the fluid must be drawn from it by means of cocks. It cannot be removed to be rinsed and wiped by the cook, which, among those who are cleanly, is a point of some importance. The oven, or case, at top, is less *comeatable* than it ought to be, and in general it appears likely to give out too much of the odor of the good things before they are ready for the table ; a defect very common in cooking stoves.

From the Mechanics' Assistant.

CUTTING STEEL WITH SOFT IRON.

This was done and an account of it published many years ago in England, but the following extract from Silliman's Journal is the most simple application we have seen, and this may be tried by thousands without incurring expense: we give it in preference to others. The fact is, that *soft* iron will *cut hard* steel, for the same reason that soft water makes an indention in hard stone, by a continual dropping, and had his reverence been a classical scholar, he would have recognized an old latin example, precisely upon this point. The soft iron cuts the hard steel because the iron constantly works on the same line on the steel, which it makes *hot* and *soft;* besides, the soft iron *impringes* on the steel, in proportion to its *momentum*, that is, its rapidity multiplied into its weight : the edge of the iron, through its circumference, comes in contact with a single point, or rather small line on the steel, the iron therefore keeps comparatively cool and consequently hard, and wears on the whole circumference, while the object cut, wears only in one part. It is evident that everything must depend upon the accuracy of the instrument, so that the same line may be struck at each revolution of the iron. The iron not touching the steel is utter nonsense. We have seen the bottom of a black wine bottle cut off, by a cord and the application of cold water, simply by coiling the cord over the bottle backwards and forwards, and then suddenly plunging the bottle in cold water, yet the string remained cool, but the bottle was hot in the particular part round which the string went ; should this be attempted, some contrivance should be adopted to keep the string in the same situation, during the operation, or the experiment will fail.

Extract of a letter to the Editor of Silliman's Journal, from the Rev. H. Dagget.

'I take the liberty to communicate to you a fact which has lately come to my knowledge, and which I judge may be of considerable use to the mechanics, and perhaps in philosophy. It may not, however, be new to you.

Mr. Barnes (a cabinet maker of this place) had occasion to repair a cross-cut saw, to be used by two persons, of a very hard plate, which would require considerable labor in the usual way of filing. He recollected having heard that the Shakers sometimes made use of what he called a buzz, to cut iron. He therefore made a circular plate of sheet iron, (a piece of stove pipe,) fixed an axis to it, and put it in his lathe, which gave it a very powerful rotary motion. While in motion he applied to it a common file, to make it perfectly round and smooth, but the file was cut in two by it, while it received itself no impression. He then applied a piece of rock crystal, which had the desired effect. He then brought under it the saw plate, which in a few minutes was neatly and completely cut through longitudinally. When he stopped the buzz, he found it had received no wear from the operation, and that he could immediately apply his fingers to it, without perceiving much sensible heat. During the operation, there appeared a band of intense fire round the buzz, continually emitting sparks with great violence. He afterwards marked the saw for teeth, and in a short time cut them out by the same means.'

From the New York Mechanics' Magazine.

LAMBERT'S CANE RIFLE.

This drawing represents the most compact and convenient rifle that we have ever seen, and we think has ever been invented.

The top figure represents it entirely shut, having the appearance of a substantial walking cane.

In the figure underneath it is represented ready for firing, in which position it can be placed almost instantaneously. The head is drawn out sufficiently far for the socket or ferule at the muzzle (which is attached by a strap of metal in the side of the socket, with a hinge at the extremity) to fall off by its own weight, (see drawing.) The cock is a bent lever of steel, made to turn and move on a hollow pivot pin, containing a chamber for powder, which is continued through the screw by which it is inserted, and opens into the barrel. The trigger lays in the plate which covers

the lower side of the cock. By bending down the head of the cane (see drawing) the lower edge of the slide plate* catches a small dog of steel, with a notch or tooth in it, which rests on a spring let into the foot of the cock, and thus elevates the long arm of it. The head thus bent serves for a breech, by which the gun is conveniently held and aimed, by looking through a small slit in the cock over the sight in the ferule.

ANTIQUITY OF MECHANICAL SCIENCE.

We read in Genesis, that ships were as old, even on the Mediterranean, as the days of Jacob. We likewise read that the Philistines brought thirty thousand chariots into the field against Saul; so that chariots were in use 1070 years before Christ. And about the same time architecture was brought into Europe. And 1030 years before Christ, Ammon built long and tall ships, with sails, on the Red Sea and Mediterranean. And, about ninety years after, the ship Argo was built, which was the first Greek vessel that ventured to pass through the sea, by help of sails, without sight of land, being guided only by the stars. Dædalus, also, who lived 980 years before Christ, made sails for ships, and invented several sorts of tools for carpenters and joiners to work with. He also made several moving statues, which could walk or run of themselves. And, about 800 years before Christ, we find in 2d Chron. xv. that Uzziah made in Jerusalem, engines, invented by cunning men, to be on the towers and upon the bulwarks, to shoot arrows and great stones withal. Corn mills were early invented; for we read in Deuteronomy, that it was not lawful for any man to take the nether or the upper millstone to pledge; yet water was not applied to mills before the year of Christ 600, nor windmills used before the year 1200. Likewise, 580 years before Christ, we read in Jeremiah xviii. of the potters, wheel. Architas was the first that applied mathematics to mechanics, but left no mechanical writings behind him; he made a wooden pigeon that could fly about. Archimedes, who lived about 200 years before Christ, was a most subtle geometer and mechanic. He made engines that drew up the ships of Marcellus at the siege of Syracuse; and others that would cast a stone of a prodigious weight to a great distance, or else several lesser stones, as also darts and arrows; but there have been many fabulous reports concerning these engines. He also made a sphere which showed the motion of the sun, moon and planets. And Polidonius afterwards made another which showed the same thing.

* By 'slide plate' we mean a cylindrical metal plate of even diameter, about three inches in length, which is inserted in the head of the cane, and which encloses the lock when it is shut up.

In these days, the liberal arts flourished, and learning met with proper encouragement ; but afterwards they became neglected for a long time. Aristotle, who lived about two hundred and ninety years before Christ, was the first that writ any methodical discourse on mechanics. But, at this time, the art was contained in a very little compass, there being scarce anything more known about it than the six mechanical powers. In this state it continued till the sixteenth century, and then clock work was invented, and about 1650, were the first clocks made. At this time, several of the most eminent mathematicians began to consider mechanics ; and by their study and industry have prodigiously enlarged its bounds, and made a most comprehensive science. It extends through heaven and earth ; the whole universe, and every part of it, is its subject. Not one particle of matter but what comes under its laws. For what else is there in the visible world, but matter and motion ? and the properties and affections of both these are the subject of mechanics.—*Emerson.*

TRUST TO YOURSELF.

'TRUST TO YOURSELF'—is a glorious principle for the industrious and trading classes of the community ; and yet the philosophy of it is not perhaps understood so well as it ought to be.

There is hardly anything more common in the country than to hear men spoken of who originally, or at some period of their lives, were rich, but were ruined by '*security*'—that is, by becoming bound to too great an extent for the engagements of their neighbors. This must arise in a great measure from an imperfect understanding of the question; and it therefore seems necessary that something should be said in explanation of it.

I would be far from desiring to see men shut up their hearts against each other, and each stand, in the panoply of his own resolutions, determined against every friendly appeal whatsoever. It is possible, however, to be not altogether a churl, and yet to take care lest we be tempted into an exertion of benevolence dangerous to ourselves, while it is of little advantage to our friends.

Notwithstanding the many ties which connect a man with society, he nevertheless bears largely imprinted on his forehead the original doom, that he must chiefly be dependent on his own labor for subsistence. It is found by all men of experience, that, in so far as one trusts to his own exertions solely, he will be apt to flourish; and, in so far as he leans, and depends on others, he will be the reverse. Nothing can give so good a *general* assurance of well doing as the personal activity of the individual, day by day, exerted for his own interest. If a man, on the contrary, suddenly finds, in the midst of such a career, a prospect of some

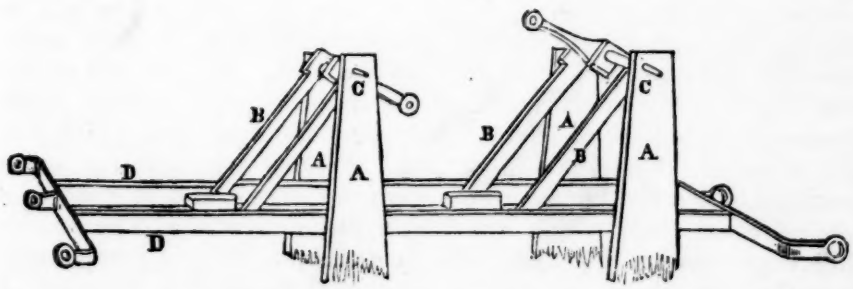
patronage which seems likely to enrich him at once, or if he falls into the heritage of some antiquated claims to property or title, that he thinks it necessary to prosecute, it is ten to one that he declines from that moment, and is finally ruined. The only true way to make a happy progress through this world is to go on in a dogged, persevering pursuit of one good object, neither turning to the right nor to the left, making our business as much as possible our pleasure, and not permitting ourselves to awake from our *dream of activity*—not permitting ourselves to *think that we have been active*—till we suddenly find ourselves at the goal of our wishes, with fortune almost unconsciously within our grasp.

Chambers.

From the Journal of the Franklin Institute.

HUSE'S MODE OF WORKING THE LEVERS OF FIRE ENGINES.

To all whom it may concern, be it known, that I, Samuel Huse, of Newburyport, in the county of Essex, and state of Massachusetts, have invented an improved method of working the levers of fire engines, and of other similar machinery, and that the following is a full and exact description of the same, reference being had to the accompanying drawing, which makes a part of this specification.



AAAA are standards which serve to support the fulcrums of the levers BBBB, as seen at CC. The lower ends of these levers working on joints in the traversing bars DD.

The uses of the other parts represented in the drawing will be evident upon inspection, and as they make no part of my invention, but are common to many fire engines, they do not require to be described.

The object is to work engines of this discription by traversing motion, the handles being attached to the traversing bars DD, which constantly preserve their horizontal position, and rise and fall no more than is due to the segment of the curve formed by the lower ends of the levers BB.

When an engine is worked in this way, it is necessary to scotch

the wheels, or in some other way to prevent a backward and forward motion in the body of the engine. This may be effected in various ways, or if preferred, there may be sliding bolts, or screws, made in the manner of legs, which may descend from the body of the engine, and support it whilst in action, independently of the wheels. I sometimes make the levers work across the engine, and in this case the wheels require but little checking.

I do not intend to confine myself, in carrying my said plan into operation, to the exact mode which I have here represented; but what I claim as my invention is the constructing the working levers of fire engines, and of similar machinery, by attaching the handles thereto, so that the levers shall work backwards and forwards in the manner of a pendulum, upon the principle herein fully set forth.

SAMUEL HUSE.

GAS MANUFACTORY.

THE Gas Manufactory, at the north part of Boston, has excited some attention, from the extensive use of gas in almost every part of the city. The following account from the correspondent of the Portland Advertiser, may be acceptable to our readers:

'The Gas House is an extensive brick building, at the north part of the city, marked by its lofty chimney and the dense smoke continually rolling from it. The process of making the gas is simple, although the machinery for its manufacture is quite complicated, and must have cost an immense sum. In one part of the building are furnaces, emitting an intense heat. Over these furnaces are boilers or ovens, containing the coal from which the gas is made. The smoke, gas, and tar rise together for some distance, when the tar separates from the smoke and is conveyed into cisterns, from which it is drawn out and sold. The smoke then continues on, I believe, to a large tub, in which it is separated from the gas, while the latter is conducted through a number of feet of pipe, similar in shape to a distiller's worm, under ground, for the purpose of condensing. It then enters the gas house again, passes through the refiner into a metre, and from the metre into a grand receiver, where it is ready for use. The metre is filled with water, and has a dial upon it which gives the accurate quantity of gas manufactured. There are two receivers, the size of which are 20 by 40 feet. Each receiver is divided into two parts. They shut into the bottom. The top part contains the gas, and bottom part water. The gas is conducted by a pipe through the water into the top part, which, as the gas fills it, rises from out the water, being balanced by an immense weight. When the receiver is full, the top is raised; but as the gas is used from it, it gradually sinks into the lower part, and its weight is of sufficient force to press the gas to any part of the city. The gas

manufactured here, is a compound of coal and rosin gas. The rosin gas is of service in neutralizing the bad smell of the coal gas. The rosin also produces oil, which is used for fuel. The coal used is Newcastle coal. It costs $9 per chaldron; and after the gas is extracted, it is worth $7.

The tar made from the coal brings $7 per barrel, and eight bushels of coal make a barrel of tar, besides the gas! If this is not a self-creating fund, I know not what is. The price of the gas is half a cent per foot. The lower part of each receiver contains 1500 hhds. of water. The receivers are of cast iron. The gas is conveyed under ground through leaden pipes, to the different parts of the city.'

The receivers mentioned above, are commonly called gasometers, and are in the form of a cylinder and open at the bottom. We presume they are 40 feet diameter, and 20 feet high, and are made of sheet iron; and instead of leaden pipes under ground they are of cast iron. EDS. Y. M.

Translated for the Journal of the Franklin Institute.

POLYTECHNIC SOCIETY OF PARIS.

The editor has received from M. De Moleon, of Paris, the subjoined prospectus of the intentions of this Society, and it will afford him sincere pleasure to be made the medium of communication between this institution and any of his fellow citizens. His public situation in the department of State affords him facilities for transmitting to Paris papers or other articles, if delivered to him, free of expense, in the city of Washington, or left in the charge of the Actuary of the Franklin Institute in Philadelphia.

Not many years have elapsed since our country was dependent upon Europe for almost everything which was new either in science or the arts, but in this particular a rapid revolution has been effected, and we have now much of our own to offer in exchange for the information which we derive from the old world; and the principle both of national and individual honor urges us to be on the alert in cementing those ties by which the friends of literature and science all over the world are united, and form one great republic, whose united aim is the attainment of the highest intellectual, moral, and physical good.

'Polytechnic Society.—This society has been established by the former pupils of the polytechnic school, all of whom are conversant with the useful arts, and with commerce.

The object of the society is to promote the progress of the useful arts, and to supply the wants of the manufacturing, commercial, and agricultural classes, more especially in France. Its principal means are—

1. An extensive correspondence with its members at home and abroad.

2. A capability, in consequence of an understanding with the heads of establishments, of seeing all orders faithfully executed.

3. A large collection of very perfect models of machines to serve as specimens, and to be exhibited at a particular place.

4. The *Receuil Industriel, &c.* of M. De Moleon; a valuable and interesting journal, which is the vehicle of all the observations and discoveries of the society, and of the results of the communications of its members in every part of the world.

In its organization are included—

1. The class of manufacturers, who attend to the interests of manufacturers, machinists, &c.

2. The class of manufacturers, who watch over rural economy.

3. The class of commercialists, whose vigilance is directed to commerce and its various dependent interests.

Foreign ambassadors are invited to supply the wants of their respective countries through the agency of this society; they will address "*Au directeur de la Societe Polytechnique, Rue neuve-des-Capucines, No.* 13 *bis.*" '

M. De Moleon, in a letter to the Editor, says that, 'The design of this society is to supply the wants of the productive classes in all countries; to obtain for the use of manufacturers, mechanics, agriculturalists, and artists, the machines which may be useful to them, either in the form of models, or of operating instruments; to attend to their completion, and the transmission of them wherever they may be required; to furnish to those engaged in commerce such documents, and other aids as may contribute to its prosperity.'

QUESTION.

AFTER mowing a strip 2 rods in width around a lot in the form of a right angled triangle, containing 3 acres, I found I had cut one half the grass. Required the length of the base and perpendicular? C. M.

TO CORRESPONDENTS.

A communication from W. W. C. is received, and under consideration.